

Name: Solutions

**Directions:** Please completely factor each polynomial shown below.

1. $m^3 + 1$ $(m+1)(m^2 - m + 1)$	2. $4m^2 + 8m + 12$ $4(m^2 + 2m + 3)$
3. $m^3 + 8n^3$ $(m+2n)(m^2 - 2mn + 4n^2)$	4. $m^4 + 10m^2 + 24$ $(m^2 + 4)(m^2 + 6)$
5. $wm - 8w$ $w(m - 8)$	6. $7m^2 - 63m$ $7m(m - 9)$
7. $m^3 + 3m^2 + 16m + 48$ $(m^3 + 3m^2) + (16m + 48)$ $m^2(m + 3) + 16(m + 3)$ $(m + 3)(m^2 + 16)$	8. $5m^4 - 30m^3 + 45m^2$ $5m^2(m^2 - 6m + 9)$ $5m^2(m - 3)(m - 3)$ $5m^2(m - 3)^2$
9. $16m^2 + 24m + 9$ $(4m + 3)(4m + 3)$ $(4m + 3)^2$	10. $5m^2 - 8m - 21$ $(5m + 7)(m - 3)$
11. $m^2 + 36$ DNF or Prime	12. $m^2 - 121$ $(m - 11)(m + 11)$

<p>13. <math>m^3 - n^3</math></p> $(m-n)(m^2 + mn + n^2)$	<p>14. <math>9m^3 + 45m^2 - 4m - 20</math></p> $9m^2(m+5) - 4(m+5)$ $(m+5)(9m^2 - 4)$ $(m+5)(3m-2)(3m+2)$
<p>15. <math>5m^3 - 10m^2 - 120m</math></p> $5m(m^2 - 2m - 24)$ $5m(m-6)(m+4)$	<p>16. <math>5m^2 - 17m - 12</math></p> $(5m + 3)(m - 4)$
<p>17. <math>m^4 - 21m^2 - 100</math></p> $(m^2 - 25)(m^2 + 4)$ $(m-5)(m+5)(m^2 + 4)$	<p>18. <math>m^4 - 29m^2 + 100</math></p> $(m^2 - 4)(m^2 - 25)$ $(m-2)(m+2)(m-5)(m+5)$
<p>19. <math>m^3 + 3m^2 - 8m - 24</math></p> $(m^3 + 3m^2) - (8m + 24)$ $m^2(m+3) - 8(m+3)$ $(m+3)(m^2 - 8)$	<p>20. <math>m^2 - 12m + 36</math></p> $(m-6)(m-6)$ $(m-6)^2$
<p>21. <math>5m^3 - 45m</math></p> $5m(m^2 - 9)$ $5m(m-3)(m+3)$	<p>22. <math>9m^2 - 16</math></p> $(3m-4)(3m+4)$
<p>23. <math>4m^2 + 9</math></p> <p>DNF or Prime</p>	<p>24. <math>3m^2 - 20m - 32</math></p> $(3m+4)(m-8)$

<p>25. <math>6m^2 + 17m - 3</math>  <math>(6m - 1)(m + 3)</math>  compare to #34</p>	<p>26. <math>2m^2 + 32</math>  <math>2(m^2 + 16)</math></p>
<p>27. <math>8m^3 - 27n^3 = (2m)^3 - (3n)^3</math>  <math>(2m - 3n)(4m^2 + 6mn + 9n^2)</math></p>	<p>28. <math>m^4 + 5m^2 + 6</math>  <math>(m^2 + 2)(m^2 + 3)</math></p>
<p>29. <math>9m^2 - 25</math>  <math>(3m - 5)(3m + 5)</math></p>	<p>30. <math>9m^2 + 27m + 14</math>  <math>(3m + 7)(3m + 2)</math></p>
<p>31. <math>4m^2 + 12m + 9</math>  <math>(2m + 3)(2m + 3)</math>  <math>(2m + 3)^2</math></p>	<p>32. <math>5m^2 + 15m + 25</math>  <math>5(m^2 + 3m + 5)</math></p>
<p>33. <math>m^2 + 6m + 7</math>  DNF or Prime</p>	<p>34. <math>6m^2 - 17m - 3</math>  <math>(6m + 1)(m - 3)</math>  compare to #25</p>
<p>35. <math>16m^2 - 16</math>  <math>16(m^2 - 1)</math>  <math>16(m + 1)(m - 1)</math></p>	<p>36. <math>m^4 - 1</math>  <math>(m^2 - 1)(m^2 + 1)</math>  <math>(m - 1)(m + 1)(m^2 + 1)</math></p>